

Web Accessibility and Usability

"When beauty is all there is, than perfection is upon us"

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Inhoud:

Inhoud:	1
Abstract	2
Introduction	3
The Definition phase	4
Introduction	4
Accessibility	4
Usability	4
User-Interface	4
HCI – Human Computer Interaction	4
Web-Rage	5
Accessibility	6
An introduction	6
A process called Accessibility	6
Guidelines for Accessible Web Sites	6
The Disability Discrimination Act – UK Based	7
People with Disabilities and Seniors	7
Last but not least; The Universal Design	9
Usability	11
An introduction	11
Customer Experience	11
Customer Experience in detail	11
The User-Interface	12
ROI – Return On Investment	12
In conclusion	15
Bijlage 1.1 – Customer Experience – Best Practices	16
Bijlage 1.2 – User-Interface guidelines	18
Bijlage 2.0 – Bibliography	22
Bijlage 3.0 – References	24



Abstract

This project contains information about web accessibility and usability. It deals with a wide range of aspects concerning these two issues. In depth research information will be provided about disabled people using the web as their information source and why this audience is not to be ignored. Information on best practises will not be missing either.



Introduction

This paper was created to provide solid answers on the following list of research questions:

- What does accessibility and usability actually mean?
- Are they, as what is often supposed, indeed inseparable connected?
- Why is accessibility such an important issue nowadays?
- What accessibility and usability standards are available?
- What is the 'DDA' and what has it to do with accessibility?
- What categories of disabilities are there?
- With which categories of disabilities does the project have to deal?
- How can accessible and usable websites be of any profit?
- How can we have a Return on Investment?

The core of this project is to provide a basic understanding of accessibility and usability. This paper points out why understanding these aspects, when designing a web-based-system, are of such high value and importance.

The need for this research project came from my internship project, to create an as accessible and user-friendly possible knowledge base, and it will therefore function as my basic foundation for building the system.



The Definition phase

Introduction

In this phase I will provide a brief list of definitions on the most important terms used through this project. This is done not only to forecome misunderstanding but also to garantuee clerity.

Accessibility

"Accessibility: easy to understand, enjoy and get some benefit from"

Accessibility means "the quality of being at hand when needed" (Dictionary.com), however, this definition has a much broader impact when it is combined with the word 'web'; web accessibility. This means that every website should be at hand when needed without any disregards or dependence. On the other hand O'Neilly defines accessibility as: easy to understand, enjoy and get some benefit from (O'Neilly, 2003). This implies that the web should be understandable and enjoyable so anyone, no matter what, can benefit from it.

Usability

"Usability: being capable of being used"

Usable means "being capable of being used" (O'Neilly, 2003), however usability in combination with the use of technology goes far beyond that definition. Usability in such case means: "The effectiveness, efficiency, and satisfaction with which users can achieve tasks in a particular environment of a product. High usability means a system is: easy to learn and remember; efficient, visually pleasing and fun to use; and quick to recover from errors" (Orrnet.com).

User-Interface

"User-Interface: a system that controls the way it is displayed to a user and that allows the user to interact with the system"

A user-interface is most difficult to understand, it is the combination of menus, screen designs, keyboard commands, command language and online help, which creates the way a user interacts with a computer. If input devices other than a keyboard and mouse are required, this is also included. In the section on usability I will provide a deeper focus on user-interfaces (Computer Desktop Encyclopaedia).

HCI – Human Computer Interaction

"Human Computer Interaction: the design and implementation of computer systems that people interact with"

Human Computer Interaction refers to the design and implementation of computer systems that people interact with. It includes desktop systems as well as embedded systems in all kinds of devices. Although the user interface is the primary element between user and computer, HCI is a larger discipline that deals not only with the design of the screens and menus, but with the reasoning for building the



functionality into the system in the first place. It is also concerned with the consequences of using the system over time and its effect on the individual, group or organization (Computer Desktop Encyclopaedia).

Web-Rage

Web-rage is a user's frustration and anger when accessing the internet caused by such things as slow or overloaded connections, busy servers, missing links, excessive results when doing a search, and very often, poorly designed web sites that make you go through hoops to find what you want (Computer Desktop Encyclopaedia).

"Web-Rage: the user's frustration and anger when accessing the internet."



Accessibility

An introduction

“At the most basic level, web accessibility is about people being able to get and use web content. It is about designing web pages that people can present and interact without according to their needs and preferences” (Henry, 2002a).

The primary focus of accessibility is access by people with disabilities, since what for some people is pleasant to have is for others a demand. Therefore accessibility focuses more on being perceivable, operable and understandable, while usability focuses mainly on the user-interface to be effective, efficient and satisfactory.

A process called Accessibility

User-Centred Design, UCD for short, is an established and proven process for designing mainstream hardware, software and web interfaces. UCD considers usability goals and the users' characteristics, environment, tasks, and workflow in the design and of an interface (Henry, 2002b).

Unfortunately UCD is not as widely implanted as it should be, even in higher education UCD is hardly mentioned in lectures of study books, worse even during practical assignments the UCD aspects are often forgotten. This has to do with a couple of things, but mostly with one of our natures to focus on our own frame of references. This implies that we design based on our own preferences, abilities and environment.

When we point to accessibility we mean to that a system should be designed with the user in mind. This implies that during the development of the entire system, the user should never been lost out of focus. To support us by doing so, the W3C came up with some guidelines.

Guidelines for Accessible Web Sites

Because of our habit to design according our own preferences, abilities and environment there was and still is a need for a 'manual' on accessible design. W3C, the World Wide Web Consortium came with a packet of guidelines to support us by building more accessible web sites. However, a framework on accessible-design is not given; neither is an actual manual existing to informing us about the best way of designing a user-interface. This is mainly because taste is very personal and therefore hard to agree on. A standard



would be useful but is hard to realize, for that reason it does not exist. This, however, does not imply that we are entirely free to create an inaccessible web site, at least not within the UK and US.

Because we live in the European Union, I focus on the UK side of the law which forces us to develop accessible web sites. The Government and the DRC, Disability Rights Commission, have produced a number of Codes of Practice, explaining legal rights and requirements under the Disability Discrimination Act 1995. These Codes are practical guidance - particularly for disabled people, employers, service providers and education institutions - rather than definitive statements of the law. However, courts and tribunals must take them into account.

The Disability Discrimination Act – UK Based

The Disability Discrimination Act (DDA) was passed in 1995 to end the discrimination that many disabled people face. It protects disabled people in:

- employment
- access to goods, facilities and services
- the management, buying or renting of land or property
- education

More information the DDA can be found at the following web site: <http://www.drc-gb.org>

Some of it became law for employers in December 1996. Others were introduced over time.

People with Disabilities and Seniors

Between 15% and 30% of the general population have functional limitations that can affect their ability to use technology products, which is about 750 million people world wide (Kraws, L., Stoddard, S., Gilmatin, D., 1996).

There are some different categories of disabilities, below I provide a short list of the most common ones and after that I will elucidate these categories. However, before doing so I would like to provide the definition of a disabled person provided by the Disability Discrimination Act.

A disabled person is someone with a physical or mental impairment that has a substantial and long-term adverse effect on his or her ability to carry out normal day-to-day activities. This definition includes a wide range of impairments, not just people with physical disabilities or



sensory impairment, but also individuals with diabetes, epilepsy, heart disease and severe disfigurements. Because of this wide range of different impairments I only will focus on those categories who affect the way people access the internet, which are:

- visual
- hearing
- motor
- cognitive

I have to acknowledge that this categorisation is somewhat arbitrary since impairments can take a variety of forms and may exist together in combination. However, in addition people with the same category of impairments may vary in their abilities and in their preferences.

The list provided below was gathered from the BBC System Concept research; see the bibliography for more information about this source.

Visual impairment

This includes people with little or no vision who are unable to view screens without a screen reader, those with functional vision who can read a screen with a screen magnifier and those with less severe forms of visual impairment who do not require any form of assistive technology to the screen.

Hearing impairment

This includes people who are deaf and those who have partial hearing and may use a hearing aid. Some people may be deaf from birth (with sign language as their first language) whereas others may have acquired a hearing impairment.

Motor impairment

This is an extremely broad category and includes people with a range of physical disabilities, such as people with impairments in upper limb mobility, manual dexterity or physical co-ordination.

Cognitive impairment

In this category, we have focussed on individuals with learning difficulties and those with dyslexia.

- "Learning difficulties" – includes people with problems with literacy, poor information technology skills and problems with understanding information in general. The extent to which this occurs will depend on the severity of the learning difficulty, which is often categorized as mild, moderate or severe.
- "Dyslexia" – includes people who have problems decoding text and processing language, that is, problems with reading spelling and writing. The

extent to which this occurs will on the severity of the dyslexia

The Georgia Institute of Technology Graphic, Visualization, and Usability Centre reported that in fact some people with disabilities and older people have additional motivations for using the internet. People who cannot drive, who have difficulty walking, or have difficulty carrying packages are more likely to find accessible online shopping an attractive alternative to shopping in “bricks and mortar” stores. Almost 10% of the internet users have a disability and in the US alone the income of the 50 million disabled people is more than \$175 billion, according to the ISOC. Computerworld reported back in 1999 that:

- the age group with the highest concentration of online buyers is the 50 to 64 segment, with over 25% making online purchases – and the fastest-growing segment is the 65 and over.
- Altogether, almost 7 in 10 online buyers are over 40, according to a survey by Ernst & Young and the National Retail Federation.

Consider the first rule of e-commerce: make your site accessible because when people cannot find a product they cannot buy it either. Besides this statement there are many other reasons to make your site assessable and before I continue I will list the more important ones:

- Compliance with regulatory and legal requirements
- Exposure to more people: people with disabilities and seniors
- Exposure to more situation: new places, new devices
- Better design and implementation
- Cost savings (Return on Investment, ROI)

I will bring back ROI in the section on usability.

Last but not least; The Universal Design

The term was brought in from the architecture world but is recently used in ICTs, Information Communication Technologies. “Universal Design is the process of creation products (devices, environments, systems, and processes) which are usable by people with the widest possible range of abilities, operating within the widest possible range of situations (environments, conditions, and circumstances), as is commercially practical” (Bonsiepe, 1999).



Creating a universal design means that people which

- may not be able to see, hear, move, or may not be able to process some types of information easily or at all
- may have difficulty reading or comprehending text
- may not have or be able to use a keyboard or mouse
- may have a text-only screen, a small screen, or a slow internet connection
- may not speak or adequately understand the language in which the document is written
- may be in a situation where their eyes, ears, or hands are busy or interfered with (for examples driving to work or working within a loud environment)
- may have an early version of browser, a different browser entirely, a voice browser or a different operating system

can access your site and more important, that they actually can benefit from the offered information on your site. These people should be treated as humans and as all human beings they have the same rights as we. The DDA will have a major influence on web accessibility and soon more and more countries will import the DDA in their law-system.



Usability

An introduction

"Usability is a quality attribute that assesses how easy user interfaces are to use. The word 'usability' also refers to methods for improving ease-of-use during the design process" (Nielsen, 2003 - Alertbox). In the definition phase I defined usability as: "easy to learn and remember; efficient, visually pleasing and fun to use; and quick to recover from errors" (Orrnet.com). As one can see this definition is a lot broader than the definition provided by Nielsen. I think that web-usability is actually more about the 'customer-experience' than about the quality attribute itself.

The web is hard to use, research done by Creative Good has found that "over 40% of job applicants cannot figure out how to apply online" (Creative Good, 1999). Than Zona Research provided the following numbers about online shoppers, 62% has at least given up once while looking for products, and 40% had turned to traditional channels to make their purchase (Zona Research, 1999). Because of these astounding numbers customer-experience and usability studies became more important.

Customer Experience

The customer experience is all about what the customer wants, and on the web they want simplicity and service, however the internet offers complexity and technology; this means that the web offers compelling features, which works web-rage in the hand. To avert this of happening one needs to take the aspects of customer experiences such as: navigation, beauty, clarity, simplicity and good search facilities etc, in careful consideration.

When usability feats customer experience the result, at least if it was done right, will be an effective, usable and clear system.

Customer Experience in detail

It is important to know who your customers are, what their goal is, why should they chose your site, what technology are they using and how do they expect to accomplish their goals by using your site.



When the answers on the steps above are determined one should inform the development department about the results and let them focus on preventing internal politics from driving the process, drawing heavily on objectives and outside data. During the designing and developing process let customers influence your project, ask them for constant feedback and run usability tests. These steps will give you and advantage over most of your competitors.

Last but not least, is to monitor your customers. The customer experience is not a one-time event; it goes on as long as your project is running. It is essential to ask your customers for feedback, offer them options to comment on certain aspects of your project and to respond on their data. The response makes your customers feel appreciated and that might be an even more valuable experience for your customers than a perfect project.

In appendix 1.0 I provide a list of guidelines for creating the best customer experience.

The User-Interface

The user-interface enables the user to interact with the program, it offers communication possibilities, it offers information and it offers the ability to react on a certain input. The study of Human Computer Interaction, HCI, is deeply related to the user-interface. HCI studies made clear that the Graphical User Interface is most effective; therefore the most websites and programs make use of it.

A GUI is supposed to be clear, comprehensive, efficient, memorable, and needs to satisfy the users. Any difficulties the user experience in learning and using the user-interface are attributed to either the lack of a model or the clinging to a faulty model. The way to avert the problem of failing user-interfaces is to involve customers in the designing process. One should involve users throughout the entire design phase. However, in our imperfect world this is nearly impossible, the limited time and high the pressure of the principal make this involvement nearly impossible. The question here arises is if you can afford your website to be a failing one?

More specific and detailed information about what a good user-interface should contain is provided in appendix 1.1.

ROI – Return On Investment

The ROI is for many organizations a good reason to consider carefully the effort they put into their user-interface. A usable system will not only make it more accessible but it will also be a Return on Investment.



Usability increases customer experience and satisfactory, this leads to loyal customers. When you do something do it right has been my motto for a long time, and I am sure that this is true for the user-interface design.

Most software and website development managers view usability costs as added effort and expense, but in the reverse is more commonly true. Because the first 10% of the design process, when key system-design decisions are made, can determine 90% of a product's cost and performance, usability techniques help keep the product aligned with company goals (Bias & Mayhew, 1994).

Internal Return on Investment can be reached by:

- Increasing user productivity
- Decreasing user errors
- Decreasing training costs
- Decreasing user support
- And savings gained from making changes earlier in design life cycle

The external Return on Investment comes from:

- Increased sales
- Decreased customer support costs
- Savings gained from making changes earlier in design life cycle
- Reduced cost of productivity training (if training is offered through the vendor company)

(Bias & Mayhew, 1994)

Usability also plays a role in the public's perception of a company, affecting brand value and market share. About 15% (Nielsen, 1993) of the space in reviews published in trade magazine's journals and national newspapers is devoted to user friendliness or usability. Media giants such as *The new Your Times*, *the Financial times*, and *the Wall street Journal* publish weekly columns that evaluate software (Bias & Mayhew, 1994). *Info World* devotes between 18%% and 30% of its software review articles to ease of learning, ease of use, and quality of documentation (Nielsen, 1993).

In order to prove that the made statements about ROI are correct I listed a couple of statistical quotes.

"The rule of thumb in many usability-aware organizations is that the cost-benefit ration for usability is \$1:\$10-\$100; once a system is in development, correcting a problem costs



10 times as much as fixing the same problem in design. If the system has been released, it costs 100 times as much relative to fixing in design" (Gilb, 1988).

"The average user interface has some 40 flaws, correcting the easiest 20 of these yields an average improvement in usability of 50%. The big win, however, occurs when usability is factored in from the beginning. This can yield efficiency improvements of over 70%" (Dray, 1995).

"You can increase sales on your site as much as 225% by providing sufficient product information to your customers at the right time. In our recent research, we found that the design of product lists directly affected sales. On sites that did not require shoppers to bounce back-and-forth between the list and individual product pages, visitors added more products to their shopping cart and had a more positive opinion of the site. By understanding your customer expectations and needs, and designing your product lists accordingly, you can significantly increase your sales" (User Interface Engineering, 2001).

"After move.com complete the redesign of the home 'search' and 'contact an agent' features based on a user interface consulting firm's recommendations, users ability to find a home increased from 62% to 98%, sales lead generation to real estate agents increased over 150% and [move.com's] ability to sell advertising space on move.com improved significantly" (Vividence, 2001).



In conclusion

Designing and developing an accessible and usable web-system saves time, money and effort, besides that the visitors of your web-system will be loyal, satisfied and happy.

Guidelines were made available by W3C for creating a certain 'standard' and a new law was taken in place in the US and UK to advert discrimination against disabled people.

Customer experience is more important than usability and should be as positive as possible. When your customers have a bad experience with your site they will not return and be no longer a customer. The user-interface is the most important feature to ensure you a pleasant customer experience.

Including accessibility and usability early on in the designing phase will make it possible to get a great return on investment. Putting a large effort in accessibility and usability early on saves a great effort later on.



Bijlage 1.1 — Customer Experience – Best Practices

Clear, concise wording: customers do not want to read long paragraphs of text on web-sites, be brief and get to the point.

Quick page download: Less than 10 seconds on a 56k modem tested on a public network.

Appropriate page width: most customers view the Web at 800/600 resolution and still some are viewing with a 640/480. Vertical scrolling is allowed, however, horizontal scrolling is not.

Simple page design: Where appropriate, use simple page design focussed on moving customers toward completion of their goal. Do not clutter the page with dozens of features and links that most customers do not want.

Few, and small, supporting graphics: Decorative graphics can help create an aesthetic “feel” to the site that supports the brand image. But use these sparingly. If customers have to spend valuable time downloading lots of unnecessary graphics, your brand suffers.

Large graphics only when good fro the customer: large graphics should be provided only when relevant to the customer’s goal. For instance, if a customer clicks on zoom in on a product picture, the large graphic will be appropriate. However, to make your site look fine you should avoid large graphics.

Jargon-free language: Use wording that customers do understand. For example, on a travel site, do not refer to equipment – call it ‘plane’. On retail sites, give clear product names, not abbreviations.

A good search: include a prominent search function, but only if it gives accurate and concise search results.

Simple and clear navigation: The site structure should be based on what the customer wants, not how the company is organized.

Error handling: Be sure to use only necessary error handlings, give users as much choice as possible.



No manual needs: Make sure your site does not need a manual to be worked with. The user-interface should so simple that people understand it without reading a user-manual.

Avoid unnecessary animations: It is important that the user can focus on its goals, make sure your user is no victim of unnecessary distractions.

Typographic errors: Make sure there are no grammars, spelling or such errors. Avoiding them makes your site more comprehensive and clear, besides that such errors give a bad impression.

Prevent link rot: Make sure your links are consistent, which implies that 'page not found' should not happen with the linking system.

Bijlage 1.2 — User-Interface guidelines

In this appendix, the BBC summarised the opinions on accessible design that arose from their interviews with diversity experts. This appendix covers only those guidelines not described in earlier parts of this paper.

Links should contain information about their destination

Criticism was levelled at a great number of sites for containing links with meaningless titles, such as 'click here' or 'more', this was particularly evident amongst screen reader users.

The route of a link may be obvious to a sighted user due to other cues on the page, or with the inclusion of other necessary information, to a screen reader user on the same basis. However, it is likely that a screen reader user will decide at some point to use their software to list the links. Out of context they become meaningless. Therefore they should always provide information regarding the content of the target page. This was cited as helpful for the other disability groups as well. Meaningful links will help people with reading difficulties removing the need for them to have to scan the rest of the page for clues.

Provide a text only site map

This provides a useful overview of the site assisting with navigation and searching. It was said to be particularly useful for screen reader and screen magnifier users and for those with reading difficulties, but could also benefit the majority of visitors to the site.

Provide HTML alternatives to Non-text content

Disabled people realise that it is unreasonable to expect websites not to use features such as Flash and Java, since these can enrich the site for other people. However, they would like an HTML alternative for this particular content.

Ensure that tables are appropriately designed

Tables, when poorly designed, can be completely inaccessible to screen reader users. One of our interviewees demonstrated this effect: once we had progressed to the tenth row we had forgotten what the column headings were. Care should be taken to ensure that tabular information makes sense when linearised.

Limit the number of links on a page



Too many links on a page creates an intolerable mental workload for those using screen readers. It also creates a difficulty for those using screen magnifiers as they can only see small sections of the screen. People with dyslexia are also likely to experience problems as they are often unable to scan read and therefore need to read each link in turn. Reducing the number of links will contribute to the both accessibility and the general usability of the site.

Use scrolling pages not multiple pages

When using a scrolling page screen reader users are only required to navigate the information at the top of a page once. This saves time and repetition. However, scrolling pages can be difficult to negotiate for people with dyslexia who prefer to have all of the information on the page in view at all times: this reduces an otherwise intolerable mental workload. Scrolling pages can also present problems for screen magnifier users, people with learning difficulties and some people with mobility impairments.

Ensure time-outs are appropriate

A point made by a physically impaired user was that any website which has a time-out feature should allow sufficient time for those who may take longer than an 'average' person to input information. This would appear to apply to all of the disability categories we researched.

Use a plain solid background

Complex, fussy backgrounds are a source of distraction for those with difficulties reading text, both people with learning difficulties and those with dyslexia. Use of one, solid colour is preferable.

Allow the user to specify text and background colours

People with visual impairments may have problems viewing certain colour schemes. Black on white has been likened to 'reading text from a 100 watt light bulb' for some. Other people have distinct colour preferences, such as yellow text on a black background. This obviously requires the site to allow the user to change the colour settings (via the browser) to whatever is appropriate and easiest for them.

Choose an appropriate typeface

It appears to be standard practise amongst those attempting to present accessible information to use a sans serif typeface. Numerals appear to be clearest when represented in New Baskerville (promoted by the RNIB's 'See it right



campaign'). A clear typeface is useful for anyone with some degree of functional vision and/or reading difficulties.

Avoid large blocks of italics and excessive use of capitals and underlining. Both of these conspire to make text more difficult to read for everyone, but especially those with visual impairments and reading difficulties.

Avoid blinking or moving text/images

Blinking or moving text is very difficult to read for those with a visual impairment, dyslexia and learning difficulties. It is also very distracting for those who have difficulty with reading.

Provide captioning and subtitling

The number one priority when meeting the needs of people with disabilities is to create an equivalent experience. Sites that use audio and video should use captioning and subtitling.

Present information in multiple ways

Following on from the previous point, sound can also be helpful if it replicates the text being displayed. The British Dyslexia Association makes use of a sound feature for their helpline number. Presentation of the same information in a variety of ways is useful for reinforcing meaning.

Provide consistent navigation

This is particularly important for those with visual impairments and reading difficulties, but it will also contribute to the general usability of the site.

Provide accessible instructions

Some sites appear to be extremely good at including accessibility features but forget to include instructions in the format suitable for the audience. One example is the use of HTML 4.0's access-keys feature — shortcuts designed to assist users who have difficulties using a mouse or who prefer to use keyboard accelerators. Although this is laudable, it is useful only if the site provides a menu of access-keys and the information they link to.

Stick to one font

It takes someone with dyslexia time to 'tune in' to a font. A site that uses a number of fonts can cause great difficulty for them.

Avoid scrolling text boxes



People with dyslexia often have short-term memory problems. When using a scrolling text box, they sometimes forget what they have already written. All the information should be on display at all times. This will act to reduce the demand on mental workload for most people contributing to the general usability of the site.

Ensure that features that require manipulation are an appropriate size

This is particularly important for those with poor manual dexterity who use a mouse. It also provides support for those with visual impairments. Size consideration should consider links, scroll bars, buttons, data entry fields and tick boxes.

Bijlage 2.0 — Bibliography

- Bias, R. & Mayhew, D., (Eds.) (1994).** Cost-Justifying usability.
San Francisco: Morgan Kaufmann Publishers.
- Bonsiepe, G. (1999).** Interface an Approach to Design.
Maastricht: Jan van Eyck Akademie
- Burks, M., & Waddell, C. (August 6, 2001).** Universal Design for the Internet.
Retrieved November 11, 2004 from the World Wide Web:
<http://www.isoc.org/briefings/002/isocbriefing02.pdf>
- Creative Good. (1999).** E-Recruiting: Online Strategies in the War for Talent.
Retrieved November 19, 2004 from the World Wide Web:
<http://www.creativegood.com/doc/e-recruiting.pdf>
- Cole-Gomolski, B. (May 24, 1999).** Selling to Seniors.
Retrieved November 11, 2004 from the World Wide Web:
<http://www.computerworld.com/news/1999/story/0,11280,42944,00.html>
- Gilb, T. (1988).** Principles of Software Engineering Management.
England: Addison-Wesley.
- Henry, S. (April, 2002).** Constructing Accessible Web Sites.
Other authors involved:
Thatcher, J., Waddell, C., Swierenga, S., Urban, M., Burks, M., Regan, B. and Bohman, P. – However chapter one was written by Shawn Henry.
Glasshaus
- Parenthetical notes**
(Henry, 2002a, p.1)
(Henry, 2002b, p.5)
- Kraws, L., Stoddard, S., Gilmatin, D. (1996).** Chartbook on disability in the United States.
Retrieved November 10, 2004 from the World Wide Web:
<http://www.infouse.com/disabilitydata/disability/disability.pdf>
- Nielsen, J. (1993).** Usability engineering.
San Francisco: Morgan Kaufmann.
- Nielsen, J. (August 25, 2003).** Usability 101: Introduction to Usability.
Alertbox; retrieved November 18, 2004 from the World Wide Web:
<http://www.useit.com/alertbox/20030825.html>
- Robertson, V., Shelat, B., Stewart, T., Travis, D. & Tynan, A. - System Concepts Ltd**
(February 26, 2003) Accessibility study of BBCi: Problems faced by users with disabilities.
Retrieved November 05, 2004 from the World Wide Web:
http://www.bbc.co.uk/commissioning/newmedia/pdf/BBCi_Accessibility_Study_7-10-02.pdf
- The Georgia Institute of Technology Graphic, Visualization, and Usability Centre**
(October, 1998). WWW User Survey.
Retrieved November 11, 2004 from the World Wide Web:
http://www.cc.gatech.edu/user_surveys/survey-1998-10/graphs/general/q12.htm



User Interface Engineering. (2001). [Are the product lists on your site losing sales?](#)

Retrieved November 19, 2004 from the World Wide Web:

<http://world.std.com/~uieweb/whitepaper.htm>

Vividence, Corp. (2001). [Moving on up: Move.com improves customer experience.](#)

Retrieved October 15, 2001 from the World Wide Web:

<http://www.vividence.com/public/solutions/our+clients/success+stories/movecom.htm>

Zona Research. (1999). [Zona Research's Online Shopping Report.](#)



Bijlage 3.0 — References

Chapman, N. & Chapman, J. (2004). Digital Multimedia.
San Francisco: John Wiley & Sons, Ltd

Computer Desktop Encyclopaedia
<http://www.computerlanguage.com/techweb.html>

Dictionary.com
<http://www.dictionary.com>

Orrnet.com
<http://www.orrnet.com>

Scott, W. (October 26, 2000). User Interface Design: Tips and Techniques.
Retrieved November 05, 2004 from the World Wide Web:
<http://www.ambyssoft.com/userInterfaceDesign.pdf>

W3C – World Wide Web Consortium
<http://www.w3.org/TR/WCAG10/>
<http://www.w3.org/TR/WCAG20/>
<http://www.w3.org/TR/WAI-AUTOOLS/>
<http://www.w3.org/TR/WAI-WEBCONTENT/wai-pageauth.pdf>